Hamiltonian Markov Chains: sampling, dynamics and stability

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HMC is an approach to a problem of finding a normalizing constant when a distribution is known only up to a proportionality factor. The normalization becomes crucial when a sampling is needed. For example when a set is given by some constraints a characteristic function represents a uniform distribution on this set up to a constant which is the volume of the set, usually difficult to compute. Several algorithms were developed and HMC is doing very well among them. We provide an explanation of the phenomenon in terms of pure functional-analytical methods.

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